epiTRENDS

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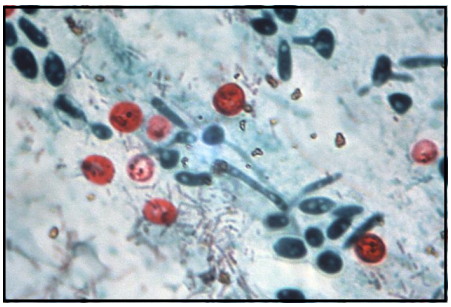
Cryptosporidiosis

Cryptosporidia were first recognized as a cause of human illness in 1976. Large municipal waterborne outbreaks were noted in the 1980s and 1990s. In the United States national reporting for the disease began in 1995. Initially there were only a few cryptosporidiosis cases reported, primarily illnesses among immunocompromised persons. Recently recreational waterborne outbreaks of cryptosporidiosis affecting children are of increasing concern.

The Organism and Disease

Cryptosporidia are parasites that can infect the intestines of people as well as animals such as dogs, cats, cattle, sheep, rodents and birds. The organism can form resistant oocysts able to withstand chemical disinfection, including normal chlorination levels for drinking water or swimming pools.



***Cryptosporidium sp.*, an intracellular protozoan parasite.**
Photo courtesy of Dr. Pearl Ma and CDC

Some people with cryptosporidial infections have no symptoms. If symptoms occur they usually begin two to ten days after infection. Typical illness includes watery diarrhea, abdominal pain, vomiting, weight loss and fever. Symptoms may be prolonged, waxing and waning over weeks. Severe chronic symptoms can occur for those with immunocompromise such as HIV infection, inherited diseases affecting the immune system, cancer, or organ transplant taking certain drugs.

Only a small number of organisms, perhaps 10 to 20, can cause illness. The cryptosporidial oocysts excreted in feces are immediately infectious. During symptomatic illness a person may have up to a billion oocysts in a single stool. Persons who are infected may continue to shed organisms for weeks even after diarrhea ends.

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The diagnosis of cryptosporidiosis depends on detection of the parasite in feces, duodenal fluid, or small intestine biopsy specimens. In most laboratories routine testing of stool specimens for ova and parasites (O&P) has generally not included cryptosporidia, unless that test was specifically ordered by the health care provider.

The current test of choice for diagnosing cryptosporidiosis is immunodetection of antigens in stool specimens, using a monoclonal antibody-based direct fluorescent antibody (DFA) assay. There are commercial products (DFA, IFA, EIA, and rapid tests) which are reportedly more sensitive than microscopy, and show good correlation with the DFA test. Kit sensitivities and specificities reportedly range from 93 to 100% when used in a clinical setting. Microscopic identification of cryptosporidia remains another diagnostic options.

Risks for Infection

With such a small infectious dose even a minor hygiene mishap can result in disease transmission. The organisms may be found in soil, food, water, and objects such as toys or surfaces contaminated with the feces from an infected humans or animal. Outbreaks have occurred in daycare centers with person to person transmission and in settings where people have contact with ill animals. Foodborne outbreaks have been associated with ill food handlers and with produce such as unpasteurized apple cider. Waterborne outbreaks have occurred even in well-maintained treated recreational settings.

Groups at particular risk for acquiring cryptosporidiosis are:

- Children and staff at child care centers
- People caring for infected children or patients
- International travelers
- People drinking unfiltered, untreated water from streams, lakes, or shallow wells
- People in contact with infected animals
- People exposed to human feces through sexual contact

Crypto is commonly spread through recreational water activities. (CDC Photo)

Recently individual cases in Washington reported exposures through recreational water, international travel, sick calves, and unpasteurized dairy products. In 2007, two of the three reported waterborne outbreaks in the state were due to cryptosporidiosis. One outbreak was associated with a lake with 12 ill and the other was associated with a pool with 14 ill.

Nationally the reported incidence for cryptosporidiosis approximately doubled from 1996 to 2006. In Washington State, reporting similarly doubled from 1994 to 2007 when 139 cases were reported. These increases might reflect an increase in diagnostic testing after licensing of a new treatment in addition to better recognition of the disease and a true increase in incidence.

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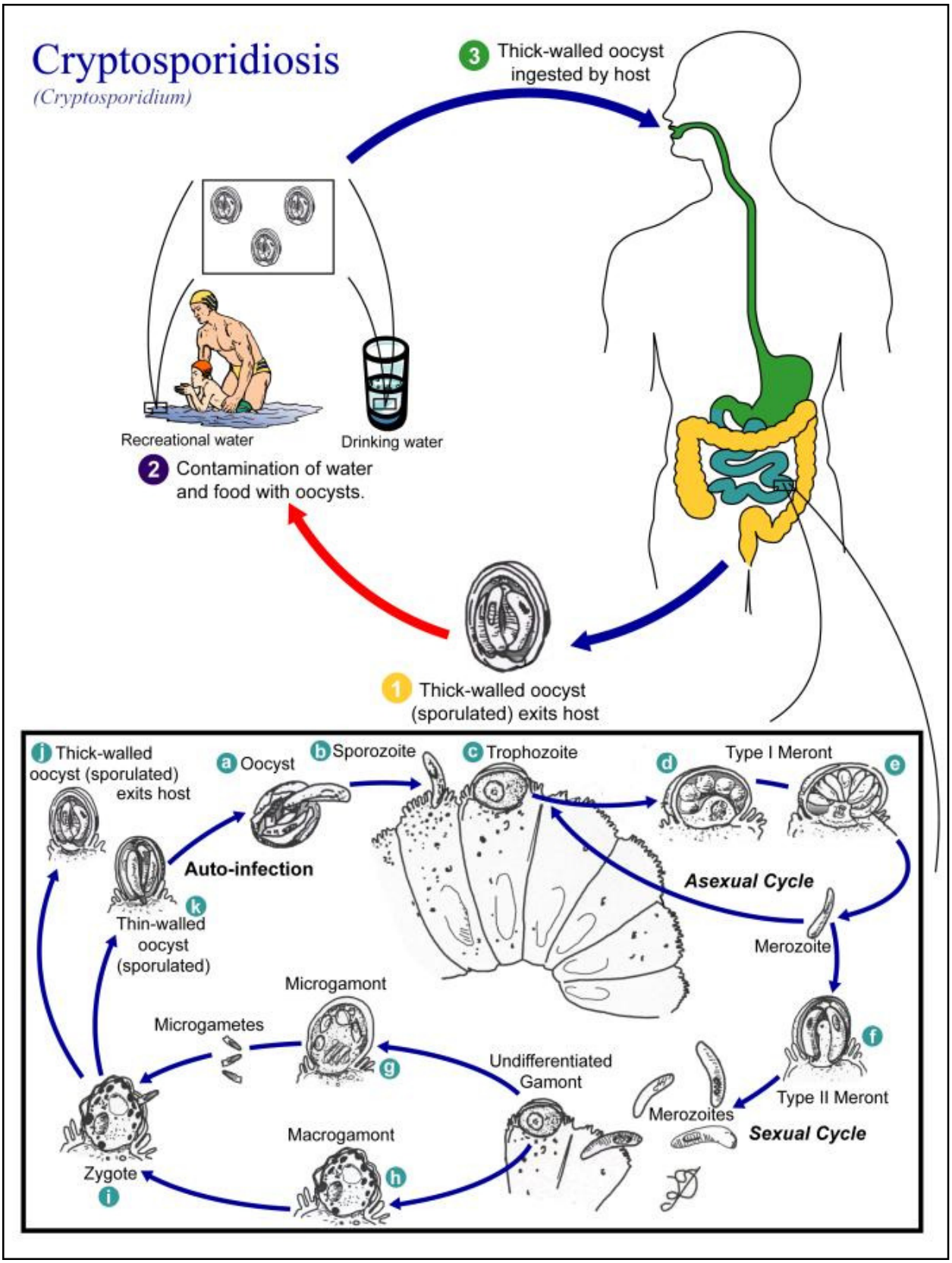

Image courtesy of CDC: Alexander J. daSilva, PhD, and Melanie Moser

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Outbreaks of Cryptosporidiosis

Person-to-person spread of cryptosporidiosis is highest among young children who are not toilet trained and the caregivers who change their diapers. Bleach solutions and other disinfectants used routinely in child care settings have little effect on the parasite. Hydrogen peroxide and ammonia are more effective environmental disinfectants for cryptosporidia. Hydrogen peroxide is generally the more acceptable choice, lacking the strong odor and fumes of ammonia. In the event of a suspected day care outbreak (two or more cases) all swimming and water play activities should be suspended to avoid transmission through contaminated water in addition to environmental cleaning.

In 2007, about 29 waterborne cryptosporidial outbreaks were reported throughout the United States. Several states including Idaho and Utah reported multiple outbreaks of cryptosporidiosis associated with recreational water venues, the majority associated with treated water such as pools, recreational water parks, or interactive fountains. In Utah from June through December there were 1,902 laboratory confirmed cases of which 80% had recreational water exposures. Enhanced control measures were implemented in such venues.

To prevent the spread of cryptosporidiosis, it is important to make sure that human and animal feces are not ingested. Persons ill with diarrhea should not enter any recreational water venue. This exclusion includes swim team members or pool staff who develop diarrhea. During outdoor activities, avoid swallowing recreational or untreated water. In regional outbreak situations, consider suspending visits to recreational water venues for high risk groups, such as groups from child care centers.

The resistance of cryptosporidial oocysts to disinfection presents a challenge for maintaining safe recreational water. Diarrheal stools are of particular risk for pathogens including *Cryptosporidium*. CDC has recommended following appropriate pool closure times to ensure inactivation of *Cryptosporidium* after fecal contamination of the water, particularly if the contamination involves diarrhea. Swimming pool operators should review existing guidelines to maintain water safety.

Individuals can take other prevention measures that will also prevent other diarrheal infections such as *E. coli* O157:H7, salmonellosis, and giardiasis that may be carried by water, food, and animals. Preventive measures are particularly important for those at risk for severe cryptosporidiosis. Wash hands thoroughly after using the toilet, handling diapers, or touching animals, particularly calves, puppies, or kittens with diarrhea. Take precautions to have safe food and water during international travel.

Resources

Avoiding Germs in Swimming Pools http://www.cdc.gov/Features/PoolParasites/

Fecal Accident Response Recommendations for Pool Staff:
http://www.cdc.gov/healthyswimming/pdf/Fecal_Incident_Response_Recommendations_for_Pool_Staff.pdf

Control measure for day care outbreaks http://www.cdc.gov/crypto/daycare/outbreak.html